

TEST DATA OF MGFS3243R3

Regulated DC Power Supply
January 6, 2017

Approved by : Takayuki Fukuda
Takayuki Fukuda Design Manager

Prepared by : Takaaki Sekiguchi
Takaaki Sekiguchi Design Engineer

COSEL CO.,LTD.

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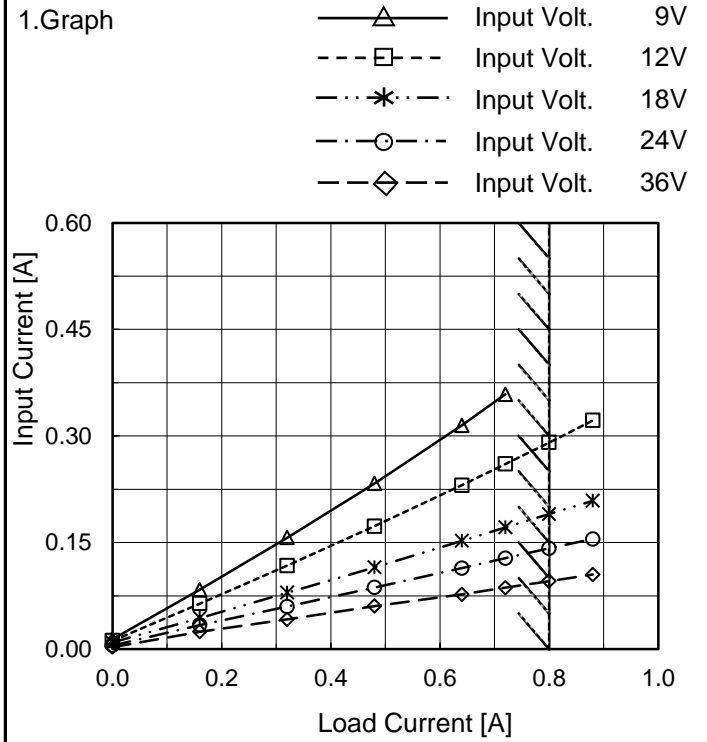


Model		MGFS3243R3		Temperature 25°C Testing Circuitry Figure A																																																																															
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Model	MGFS3243R3
Item	Input Current (by Load Current)
Object	_____

Temperature 25°C
Testing Circuitry Figure A



2. Values

Load Current [A]	Input Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	0.014	0.012	0.010	0.005	0.003
0.16	0.084	0.064	0.044	0.034	0.025
0.32	0.157	0.118	0.079	0.060	0.042
0.48	0.233	0.173	0.115	0.087	0.061
0.64	0.315	0.231	0.152	0.114	0.077
0.72	0.359	0.261	0.171	0.128	0.086
0.80	- ※	0.291	0.190	0.142	0.096
0.88	- ※	0.322	0.209	0.155	0.105
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.



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Item		Input Power (by Load Current)		Testing Circuitry Figure A																																																																														
Object		_____																																																																																
1.Graph		<p>—△— Input Volt. 9V</p> <p>---□--- Input Volt. 12V</p> <p>-·-·*·-·-·- Input Volt. 18V</p> <p>-·-·○-·-·- Input Volt. 24V</p> <p>---◇--- Input Volt. 36V</p>		2.Values																																																																														
				<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="5">Input Power [W]</th> </tr> <tr> <th>Input Volt. 9[V]</th> <th>Input Volt. 12[V]</th> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>0.13</td><td>0.16</td><td>0.17</td><td>0.12</td><td>0.11</td></tr> <tr><td>0.16</td><td>0.75</td><td>0.77</td><td>0.79</td><td>0.82</td><td>0.89</td></tr> <tr><td>0.32</td><td>1.41</td><td>1.41</td><td>1.43</td><td>1.44</td><td>1.51</td></tr> <tr><td>0.48</td><td>2.09</td><td>2.07</td><td>2.07</td><td>2.08</td><td>2.18</td></tr> <tr><td>0.64</td><td>2.81</td><td>2.75</td><td>2.73</td><td>2.73</td><td>2.78</td></tr> <tr><td>0.72</td><td>3.20</td><td>3.11</td><td>3.07</td><td>3.07</td><td>3.12</td></tr> <tr><td>0.80</td><td>- ※</td><td>3.47</td><td>3.41</td><td>3.40</td><td>3.46</td></tr> <tr><td>0.88</td><td>- ※</td><td>3.83</td><td>3.74</td><td>3.72</td><td>3.78</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>		Load Current [A]	Input Power [W]					Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	0.00	0.13	0.16	0.17	0.12	0.11	0.16	0.75	0.77	0.79	0.82	0.89	0.32	1.41	1.41	1.43	1.44	1.51	0.48	2.09	2.07	2.07	2.08	2.18	0.64	2.81	2.75	2.73	2.73	2.78	0.72	3.20	3.11	3.07	3.07	3.12	0.80	- ※	3.47	3.41	3.40	3.46	0.88	- ※	3.83	3.74	3.72	3.78	--	-	-	-	-	-	--	-	-	-	-	-	--	-	-	-	-	-
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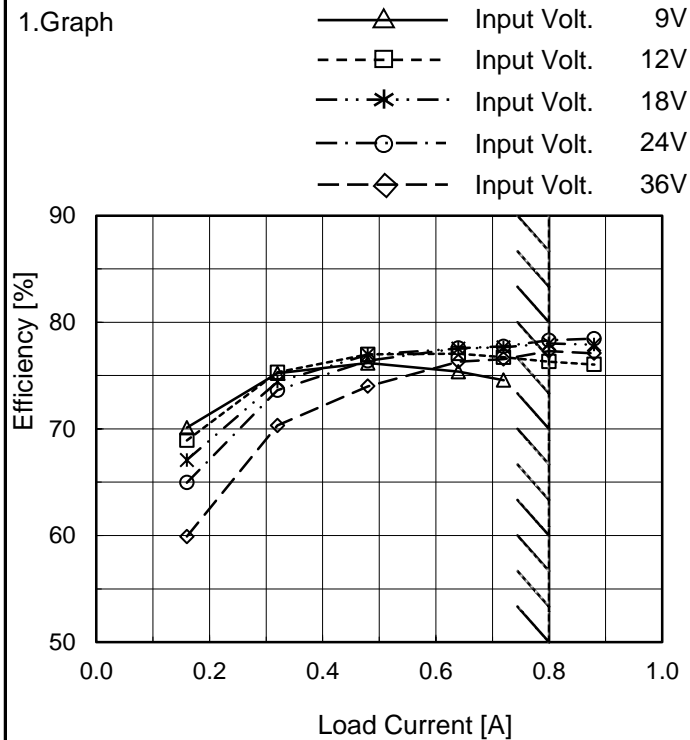


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Item		Efficiency (by Input Voltage)																																	
Object		_____																																	
1.Graph		Temperature 25°C Testing Circuitry Figure A																																	
<p>1.Graph</p> <p>---□--- Load 50% —△— Load 100%</p> <p>Efficiency [%]</p> <p>Input Voltage [V]</p> <p>Note: Slanted line shows the range of the rated input voltage.</p>		2.Values																																	
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		※1: Load 80%																																	



Model	MGFS3243R3
Item	Efficiency (by Load Current)
Object	_____

Temperature 25°C
Testing Circuitry Figure A



2.Values

Load Current [A]	Efficiency [%]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	-	-	-	-	-
0.16	70.1	68.9	67.1	65.0	59.9
0.32	75.2	75.3	74.4	73.6	70.3
0.48	76.2	77.0	77.0	76.4	74.0
0.64	75.4	77.1	77.5	77.6	76.3
0.72	74.6	76.7	77.6	77.7	76.6
0.80	- ※	76.3	78.0	78.3	77.3
0.88	- ※	76.0	77.9	78.5	77.1
--	-	-	-	-	-
--	-	-	-	-	-
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※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.

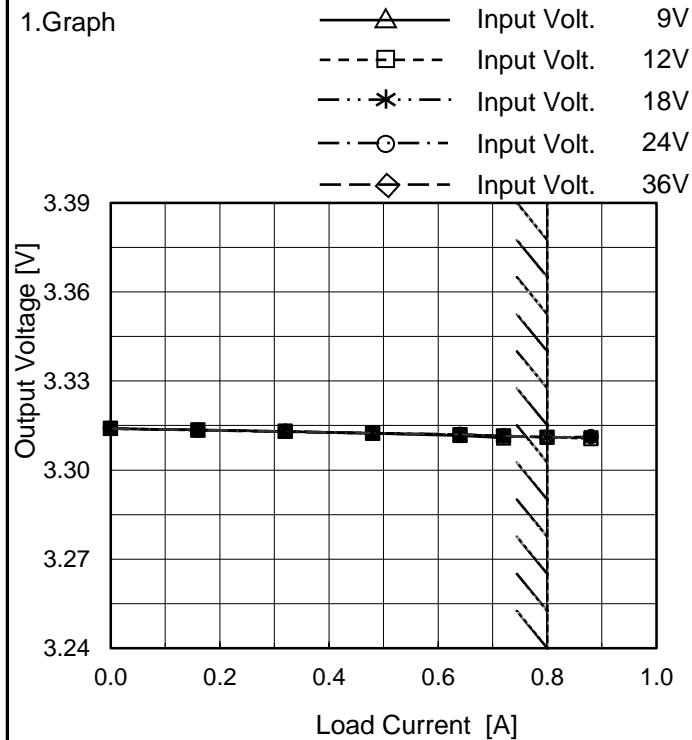


COSEL																																		
Model	MGFS3243R3																																	
Item	Line Regulation	Temperature 25°C Testing Circuitry Figure A																																
Object	+3.3V0.8A																																	
<p>1.Graph</p> <div style="text-align: right;"> <p>---□--- Load 50%</p> <p>—△— Load 100%</p> </div> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="2">Output Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr> <td>8.6</td> <td>3.313</td> <td>- ※</td> </tr> <tr> <td>9.0</td> <td>3.313</td> <td>- ※</td> </tr> <tr> <td>12.0</td> <td>3.313</td> <td>3.311</td> </tr> <tr> <td>15.0</td> <td>3.313</td> <td>3.311</td> </tr> <tr> <td>18.0</td> <td>3.313</td> <td>3.311</td> </tr> <tr> <td>24.0</td> <td>3.313</td> <td>3.311</td> </tr> <tr> <td>30.0</td> <td>3.313</td> <td>3.311</td> </tr> <tr> <td>36.0</td> <td>3.313</td> <td>3.311</td> </tr> <tr> <td>40.0</td> <td>3.313</td> <td>3.311</td> </tr> </tbody> </table> <p>※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.</p>	Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	8.6	3.313	- ※	9.0	3.313	- ※	12.0	3.313	3.311	15.0	3.313	3.311	18.0	3.313	3.311	24.0	3.313	3.311	30.0	3.313	3.311	36.0	3.313	3.311	40.0	3.313	3.311
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Model	MGFS3243R3
Item	Load Regulation
Object	+3.3V0.8A

Temperature 25°C
Testing Circuitry Figure A



2.Values

Load Current [A]	Output Voltage [V]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	3.314	3.314	3.314	3.314	3.314
0.16	3.314	3.314	3.314	3.313	3.313
0.32	3.313	3.313	3.313	3.313	3.313
0.48	3.312	3.312	3.313	3.313	3.312
0.64	3.312	3.312	3.312	3.312	3.312
0.72	3.311	3.311	3.312	3.312	3.311
0.80	- ※	3.311	3.311	3.311	3.311
0.88	- ※	3.311	3.311	3.311	3.311
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 80% of rated load current. Refer to instruction manuals for details of input derating.



Model	MGFS3243R3	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+3.3V0.8A		

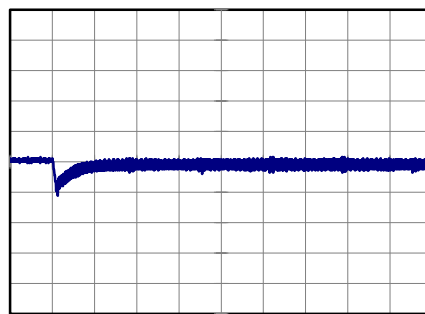
Input Volt. 24 V
Cycle 100 ms

t1,t2 = 100 μs

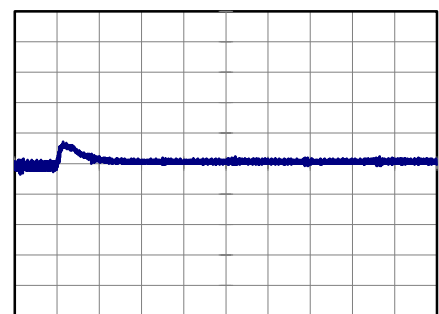


Min.Load (0A) ←→
Load 100% (0.8A)

100 mV/div



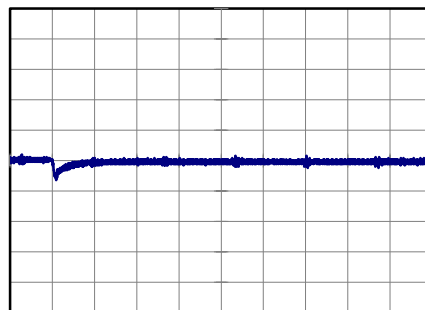
400 μs/div



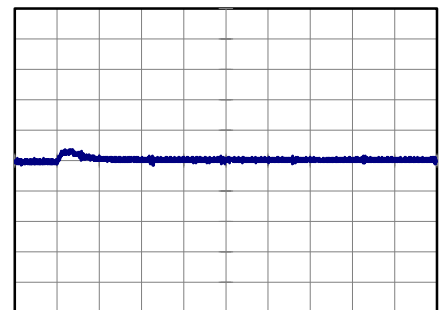
400 μs/div

Min.Load (0A) ←→
Load 50% (0.4A)

100 mV/div



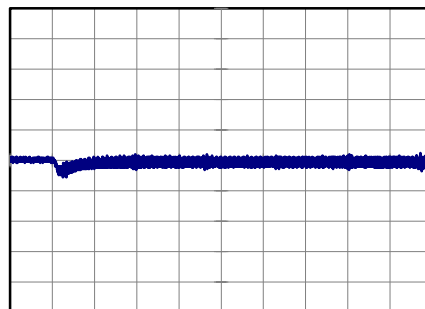
400 μs/div



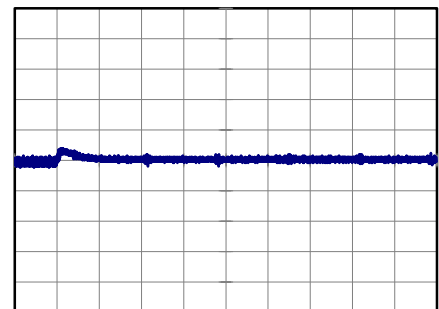
400 μs/div

Load 50% (0.4A) ←→
Load 100% (0.8A)

100 mV/div



400 μs/div



400 μs/div

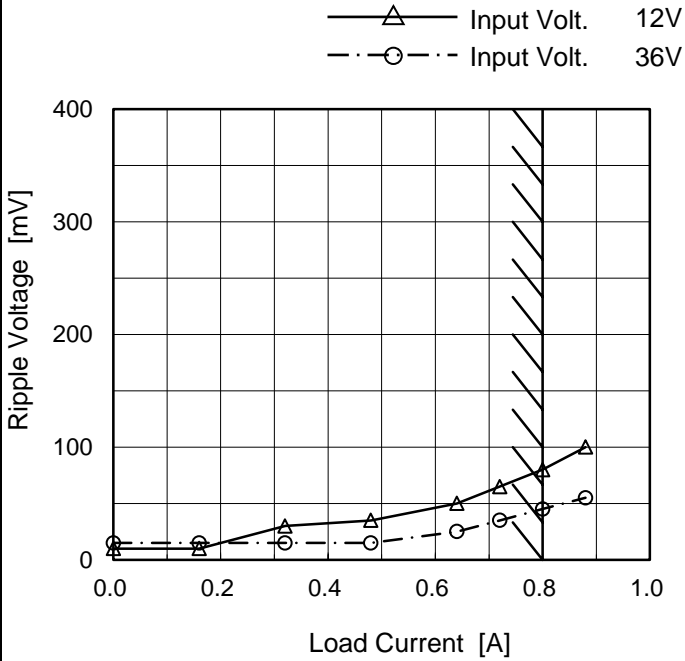


<p>Model MGFS3243R3</p>		<p>Temperature 25°C Testing Circuitry Figure B</p>																																						
Item	Ripple Voltage (by Load Current)																																							
Object	+3.3V0.8A																																							
<p>1.Graph</p> <div style="display: flex; justify-content: space-around;"> <div> <p>—△— Input Volt. 12V</p> <p>- -○- - Input Volt. 36V</p> </div> </div>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 12 [V]</th> <th>Input Volt. 36 [V]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>5</td><td>15</td></tr> <tr><td>0.16</td><td>5</td><td>10</td></tr> <tr><td>0.32</td><td>25</td><td>10</td></tr> <tr><td>0.48</td><td>30</td><td>15</td></tr> <tr><td>0.64</td><td>45</td><td>20</td></tr> <tr><td>0.72</td><td>60</td><td>30</td></tr> <tr><td>0.80</td><td>70</td><td>40</td></tr> <tr><td>0.88</td><td>90</td><td>50</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Load Current [A]	Ripple Voltage [mV]		Input Volt. 12 [V]	Input Volt. 36 [V]	0.00	5	15	0.16	5	10	0.32	25	10	0.48	30	15	0.64	45	20	0.72	60	30	0.80	70	40	0.88	90	50	--	-	-	--	-	-	--	-	-
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<p>Measured by 100 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>																																								
<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																								



Model	MGFS3243R3	Temperature	25°C
Item	Ripple-Noise	Testing Circuitry	Figure B
Object	+3.3V0.8A		

1.Graph



2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 12 [V]	Input Volt. 36 [V]
0.00	10	15
0.16	10	15
0.32	30	15
0.48	35	15
0.64	50	25
0.72	65	35
0.80	80	45
0.88	100	55
--	-	-
--	-	-
--	-	-

Measured by 100 MHz Oscilloscope.
 Ripple-Noise is shown as p-p in the figure below.
 Note: Slanted line shows the range of the rated load current.

Ripple Noise[mVp-p]

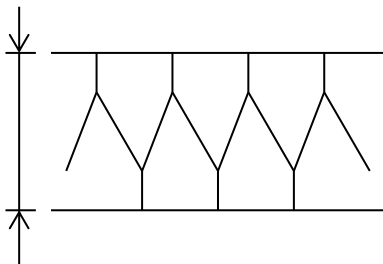


Fig.Complex Ripple Noise Wave Form

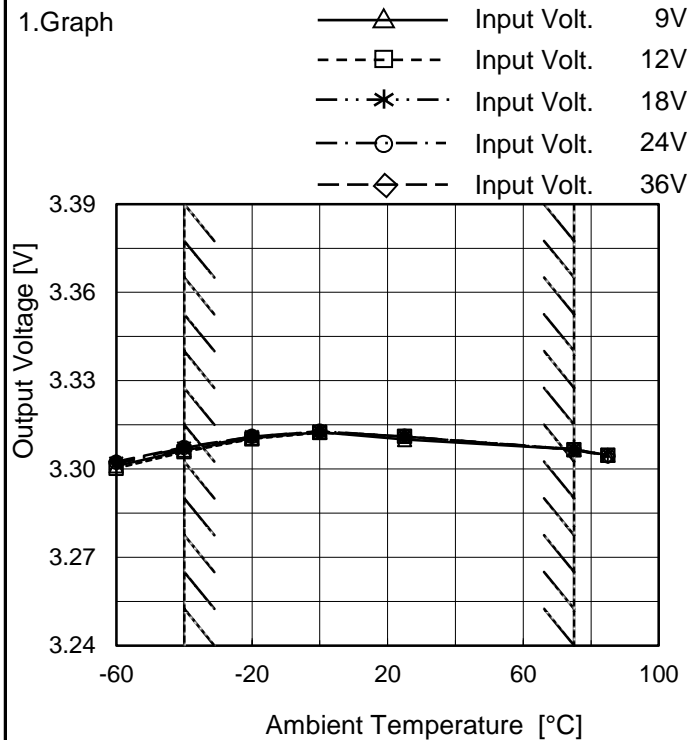


COSEL																																								
Model	MGFS3243R3																																							
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry Figure B																																						
Object	+3.3V0.8A																																							
<p>1. Graph</p> <p style="text-align: center;">Ambient Temperature [°C] Input Volt. 24V</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>-60</td><td>20</td><td>60</td></tr> <tr><td>-40</td><td>15</td><td>50</td></tr> <tr><td>-20</td><td>15</td><td>45</td></tr> <tr><td>0</td><td>10</td><td>45</td></tr> <tr><td>25</td><td>10</td><td>40</td></tr> <tr><td>75</td><td>10</td><td>40</td></tr> <tr><td>85</td><td>10</td><td>40</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-60	20	60	-40	15	50	-20	15	45	0	10	45	25	10	40	75	10	40	85	10	40	--	-	-	--	-	-	--	-	-	--	-	-
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<p>Measured by 100 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.</p>																																								



Model	MGFS3243R3
Item	Ambient Temperature Drift
Object	+3.3V0.8A

Testing Circuitry Figure A



2.Values

Ambient Temperature [°C]	Output Voltage [V]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	3.301	3.300	3.302	3.302	3.303
-40	3.306	3.306	3.307	3.307	3.307
-20	3.311	3.310	3.311	3.311	3.311
0	3.313	3.312	3.313	3.313	3.313
25	3.310	3.311	3.311	3.311	3.311
75	3.307	3.307	3.307	3.307	3.307
85	3.305	3.305	3.305	3.304	3.304
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Note: In case of Input Volt. 9V, Load 80%.
Other case Load 100%.



COSEL		Testing Circuitry Figure A
Model	MGFS3243R3	
Item	Output Voltage Accuracy	
Object	+3.3V0.8A	

1. Output Voltage Accuracy

This is defined as the value of the output voltage, regulation load, ambient temperature and input voltage varied at random in the range as specified below.

- Temperature : -40 - 75°C
- Input Voltage : 12 - 36V
- Load Current : 0 - 0.8A

* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

* Output Voltage Accuracy (Ratio) =
$$\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	25	12	0	3.315	±5	±0.2
Minimum Voltage	-40	12	0.8	3.306		



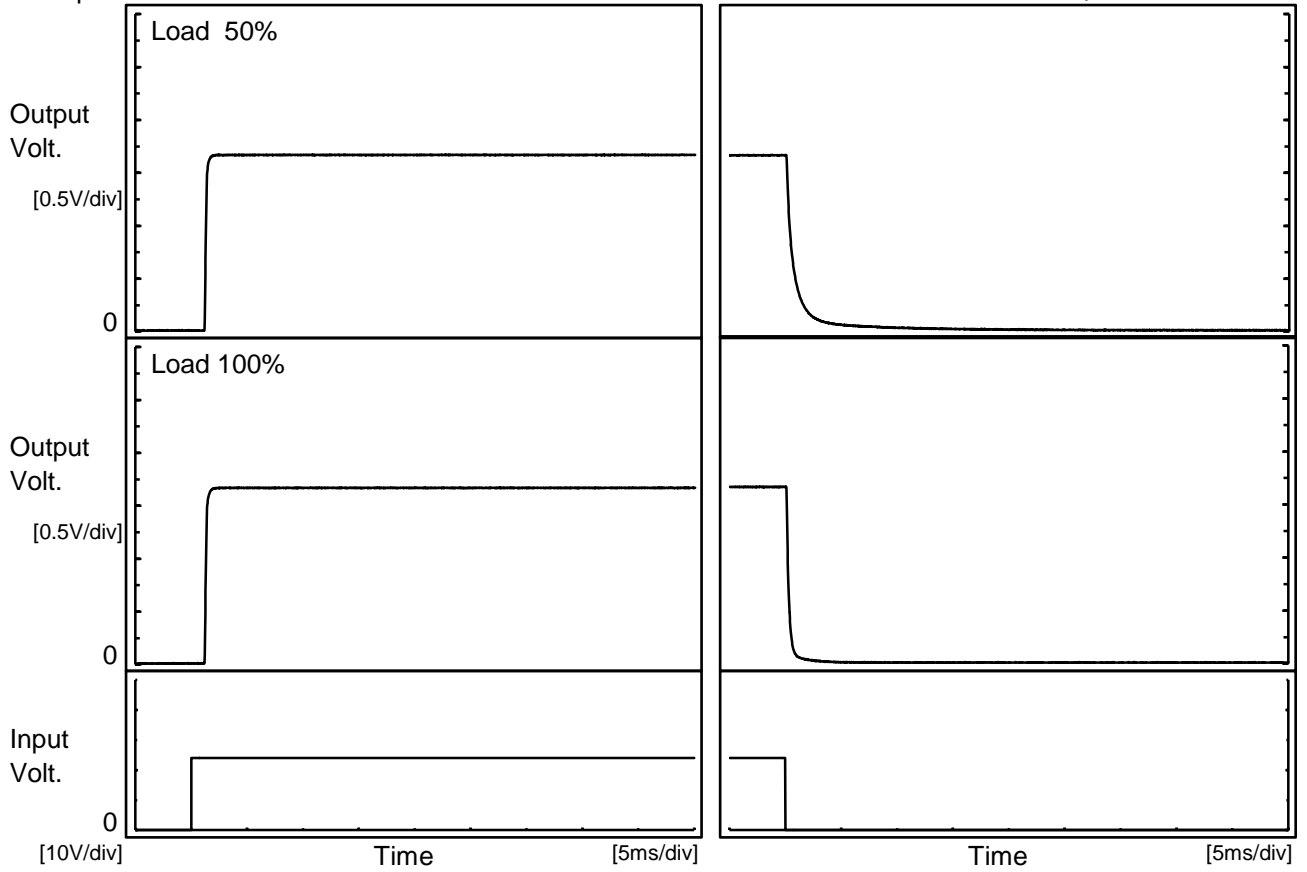
COSEL																									
Model	MGFS3243R3	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+3.3V0.8A																								
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p>Input Volt. 24V Load 100%</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>3.311</td></tr> <tr><td>0.5</td><td>3.312</td></tr> <tr><td>1.0</td><td>3.311</td></tr> <tr><td>2.0</td><td>3.311</td></tr> <tr><td>3.0</td><td>3.311</td></tr> <tr><td>4.0</td><td>3.312</td></tr> <tr><td>5.0</td><td>3.311</td></tr> <tr><td>6.0</td><td>3.311</td></tr> <tr><td>7.0</td><td>3.311</td></tr> <tr><td>8.0</td><td>3.311</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	3.311	0.5	3.312	1.0	3.311	2.0	3.311	3.0	3.311	4.0	3.312	5.0	3.311	6.0	3.311	7.0	3.311	8.0	3.311
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Model	MGFS3243R3	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+3.3V0.8A		

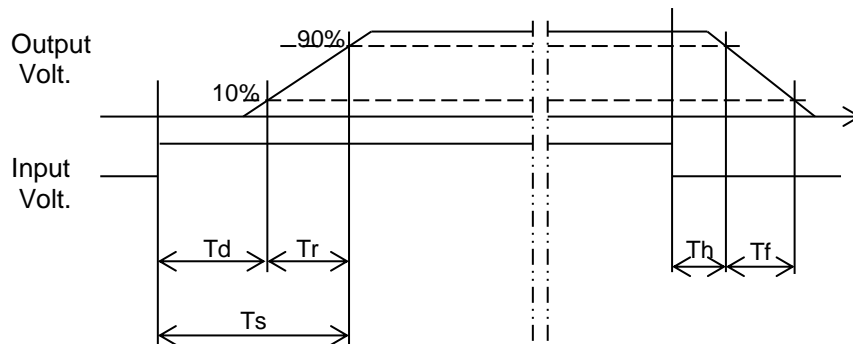
1. Graph

Input Volt. 24 V



2. Values

		[ms]				
Load \ Time	Td	Tr	Ts	Th	Tf	
50 %	1.2	0.2	1.4	0.2	1.9	
100 %	1.2	0.2	1.4	0.1	0.5	

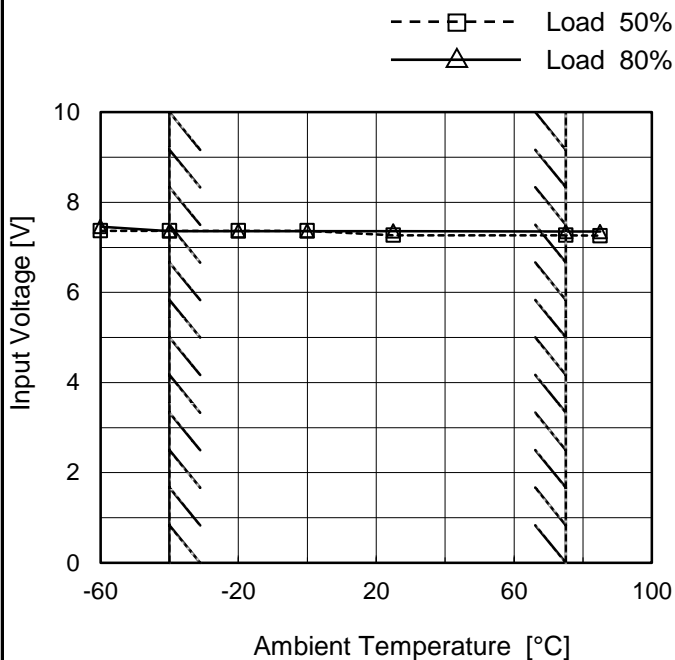




Model	MGFS3243R3
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V0.8A

Testing Circuitry Figure A

1. Graph



2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 80%
-60	7.4	7.5
-40	7.4	7.4
-20	7.4	7.4
0	7.4	7.4
25	7.3	7.4
75	7.3	7.4
85	7.3	7.4
--	-	-
--	-	-
--	-	-
--	-	-

Note: Slanted line shows the range of the rated ambient temperature.



<p>Model MGFS3243R3</p>		<p>Temperature 25°C</p>																																																																																				
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<p>1.Graph</p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <p>— Input Volt. 9V</p> <p>— Input Volt. 12V</p> <p>— Input Volt. 18V</p> <p>— Input Volt. 24V</p> <p>— Input Volt. 36V</p> </div> </div> <p style="text-align: center;">Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Maximum output current at minimum input Voltage is 80% of rated load current.</p> <p>Refer to instruction manuals for details of input derating.</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="5">Load Current [A]</th> </tr> <tr> <th>Input Volt. 9[V]</th> <th>Input Volt. 12[V]</th> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr><td>3.14</td><td>0.856</td><td>0.980</td><td>1.037</td><td>1.002</td><td>1.003</td></tr> <tr><td>2.97</td><td>0.882</td><td>1.010</td><td>1.064</td><td>1.025</td><td>1.022</td></tr> <tr><td>2.64</td><td>0.938</td><td>1.075</td><td>1.121</td><td>1.074</td><td>1.061</td></tr> <tr><td>2.31</td><td>1.008</td><td>1.148</td><td>1.180</td><td>1.125</td><td>1.108</td></tr> <tr><td>1.98</td><td>1.090</td><td>1.227</td><td>1.247</td><td>1.183</td><td>1.157</td></tr> <tr><td>1.65</td><td>1.181</td><td>1.311</td><td>1.314</td><td>1.241</td><td>1.205</td></tr> <tr><td>1.32</td><td>1.278</td><td>1.404</td><td>1.389</td><td>1.305</td><td>1.257</td></tr> <tr><td>0.99</td><td>1.392</td><td>1.505</td><td>1.472</td><td>1.368</td><td>1.311</td></tr> <tr><td>0.66</td><td>1.519</td><td>1.614</td><td>1.554</td><td>1.435</td><td>1.362</td></tr> <tr><td>0.33</td><td>1.657</td><td>1.731</td><td>1.631</td><td>1.491</td><td>1.400</td></tr> <tr><td>0.00</td><td>1.739</td><td>1.735</td><td>1.568</td><td>1.410</td><td>1.302</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>		Output Voltage [V]	Load Current [A]					Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	3.14	0.856	0.980	1.037	1.002	1.003	2.97	0.882	1.010	1.064	1.025	1.022	2.64	0.938	1.075	1.121	1.074	1.061	2.31	1.008	1.148	1.180	1.125	1.108	1.98	1.090	1.227	1.247	1.183	1.157	1.65	1.181	1.311	1.314	1.241	1.205	1.32	1.278	1.404	1.389	1.305	1.257	0.99	1.392	1.505	1.472	1.368	1.311	0.66	1.519	1.614	1.554	1.435	1.362	0.33	1.657	1.731	1.631	1.491	1.400	0.00	1.739	1.735	1.568	1.410	1.302	--	-	-	-	-	-
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<p>Model MGFS3243R3</p>		<p>Temperature 25°C</p>																																																																														
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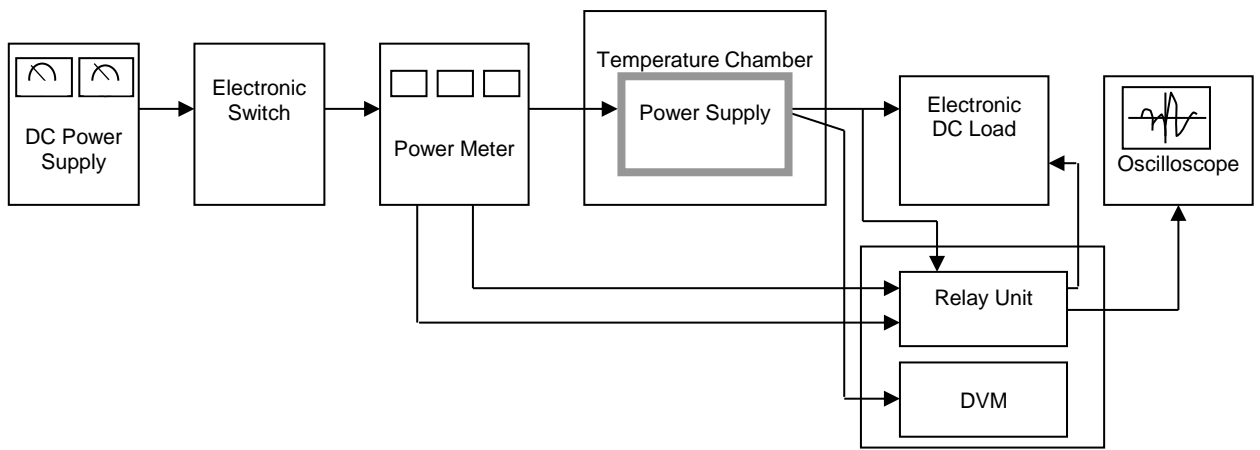


Figure A

Data Acquisition/Control Unit

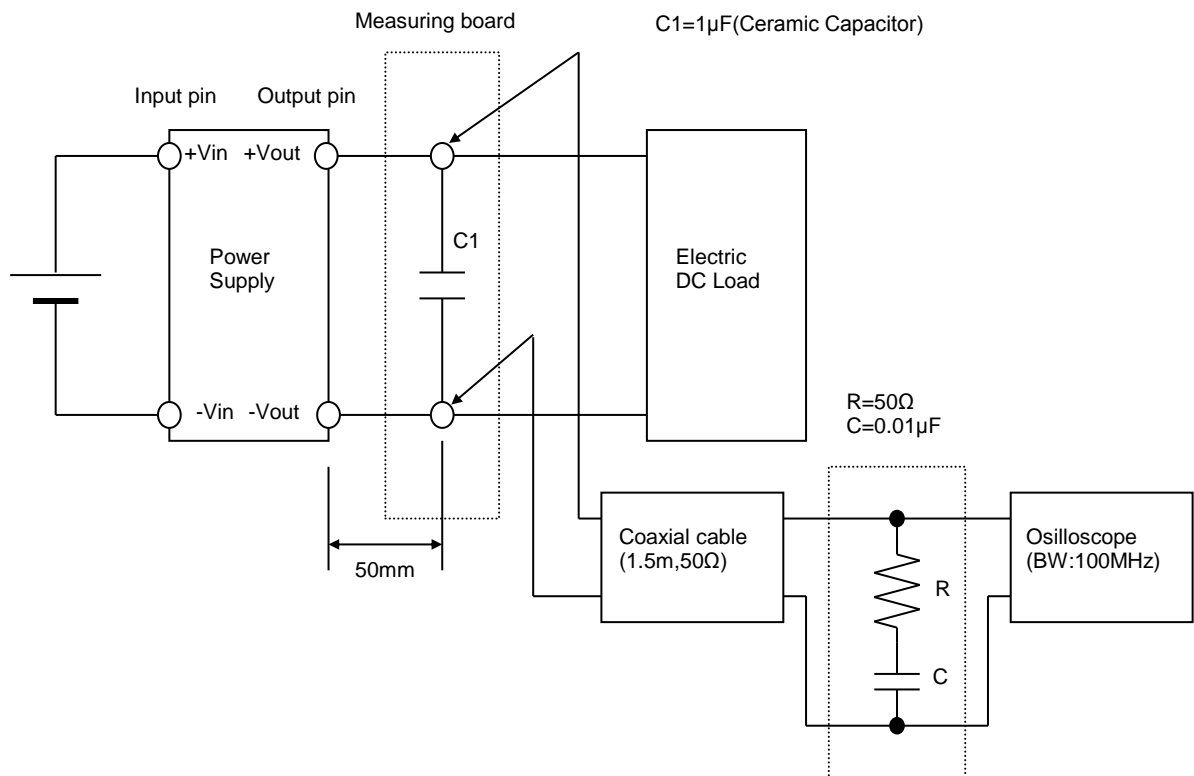


Figure B (Ripple and Ripple noise Characteristic)